

Tuesday

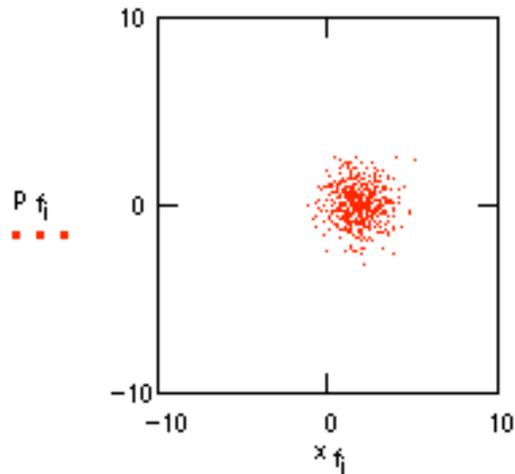
- ① Sensitivity Analyses
 - ① Injection Mismatch
 - ① Correction Systems
-
- ① A Design Study: The SSC
 - ① Lab: accelerator design

Sensitivity Analyses

- ① Magnet alignment tolerances
- ① Focusing error tolerances
- ① Vertical dispersion
- ① Injection mismatch and emittance dilution in hadron accelerators

Steering Mismatch

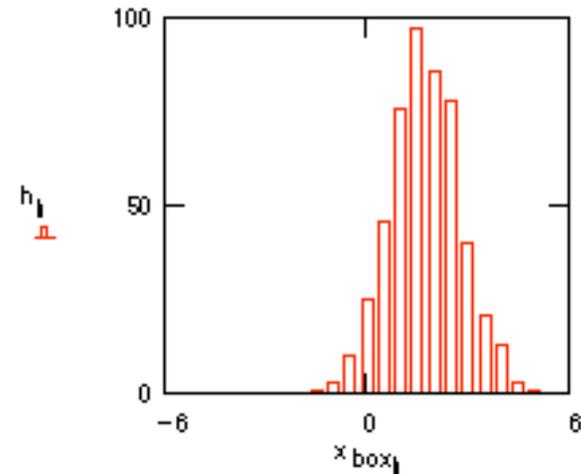
Phase Space



$$\text{mean}(x_f) = 1.985$$

$$\text{stdev}(x_f) = 1.039$$

x Profile



Emittance Increase:

$$\text{stdev}(x_f)^2 = 1.08$$

Predicted "typical" values:

(Steering Mismatch)

$$1 + \frac{1}{2} \cdot \Delta x^2 = 3$$

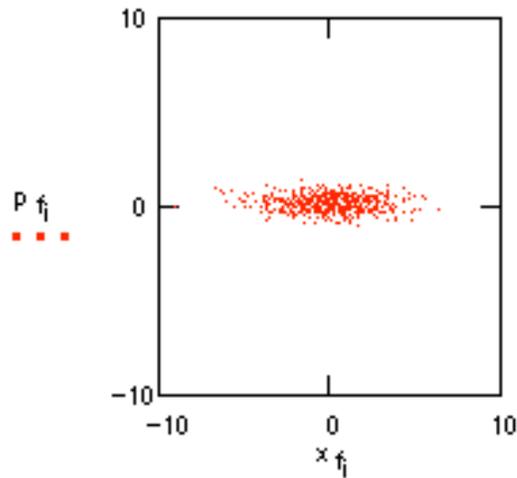
FRAME = 0

(Amplitude function Mismatch)

$$\frac{r_\beta^2 + 1}{2 \cdot r_\beta} = 1$$

Beta-mismatch

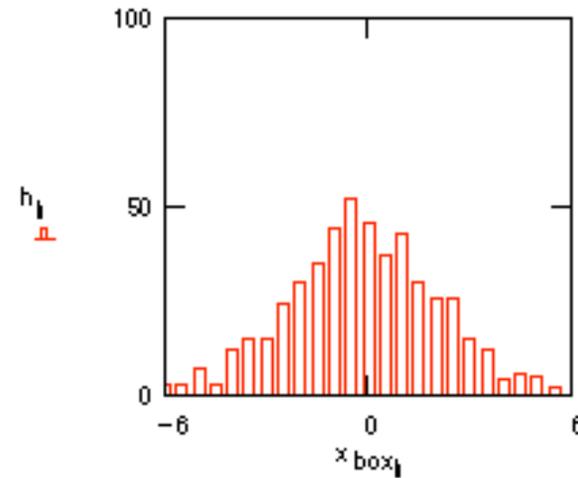
Phase Space



$$\text{mean}(x_f) = 0.056$$

$$\text{stdev}(x_f) = 2.283$$

x Profile



Emittance Increase: $\text{stdev}(x_f)^2 = 5.21$

Predicted "typical" values:

(Steering Mismatch)

$$1 + \frac{1}{2} \Delta x^2 = 1$$

FRAME = 0

(Amplitude function Mismatch)

$$1 + \frac{1}{2} \frac{\delta\beta^2}{1 + \delta\beta} = 2.6$$

SSC Design Analysis

- ① Level I Spec's: E, Lumi, ...
- ① Overall layout
- ① FODO cell specification
- ① Dispersion control
- ① Straight section functions, criteria
- ① Corrector specifications

Homework due Wednesday

👁 Problem Set 6 -- #2 and 3